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BUREAU OF ENTOMOLOGY

FOREST INSECT INVESTIGATIONS

ECHO LAKES CONTROL PROJECT

1931

by

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Berkeley, California
November 17 1931

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ECHO LAKES CONTROL PROJECT - 1931

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ECHO LAKE CONTROL PROJECT - 1931

Introduction

The Echo Lakes recreational area is located near Echo Summit, ten miles south of Lake Tahoe, at an elevation of from 7,600 to 8,000 feet. It embraces approximately 1,500 acres of timber, consisting of lodgepole pine, mountain white pine, mountain hemlock and red fir, and is surrounded on all sides by high mountains.

This area was visited during August 1930 by J.M.Miller, Bureau of Entomology, and W.W. Wagener, Office of Forest Pathology, to investigate the dying condition of timber. Conditions similar to other areas in the Lake Tahoe region were found--i.e., two distinct problems were in evidence: (1) infestations of Dendroctonus monticolae Lec. in lodgepole and white pine, and (2) infestations of Scolytus ventralis Lec. in red fir.

Estimates were made of damage to the pines, wherein about 200 trees killed during the preceding two seasons were counted. This condition was considered serious enough to warrant recommendations for control operations during the spring of 1931. No recommendations were made for the control of the fir engraver beetle, as its habits differ from those of the pine beetle and present a complex problem for which no satisfactory control remedy has yet been developed.

A fund of $300 was set up by the Forest Service to clean up the mountain pine beetle infestations within the Echo Lake basin. An additional $145.35 was allotted to complete the work when surveys and control had progressed to the point where the original allotment was exhausted.

Snow conditions during the spring of 1931 persisted until early in May, so that it was not feasible to start work until the ground was sufficiently open to permit searching the area thoroughly to locate the infested trees. A survey for this purpose was begun by G.R. Struble, Bureau of Entomology Field Station, University of California, on May 12. A crew of three timber fallers from Placerville was organized by A.N. Weber, Forest Service, and control work was started on May 16.

Methods

1. Survey. A 100 per cent cruise of all trees was made by running strips every five chains, wherever the stand was sufficiently open to permit a good view of all trees on this width of strip. In particularly heavy stands, such as occurred in certain local drainages, strips were run every two chains. All trees were examined to make sure whether attacks were present, and as infested trees were found they were mapped to facilitate their location when treated. Each tree was blazed and marked with a number in black crayon.

2. Control Methods. After a number of trees had been located, the treating crew began work. All infested lodgepoles were felled, limbed and burned, wherever conditions permitted burning without damage to reproduction or danger from fire. Where the fire danger was too great the infested bark was peeled off and the bark beetle broods were exposed to sun and predacious enemies. Logs exposed directly to the sun were treated by leaving them to absorb enough solar heat to destroy the broods. These were turned after four days, exposing all sides to a thorough heating.

Infested white pine were peeled, since the bark on this species is too thick to allow penetration of the heat on all of the bark surface. In addition, the bark was piled near the under surface of the log and set on fire, to insure the destruction of broods in bark on the under side of logs lying on the ground.

3. Crew Organization. The crew of three men was organized into two fallers and one limber. The duties of the limber, beside removing branches and piling, included burning, barking and sun-curing, as conditions demanded. Assistance was given the limber as soon as felled trees began to pile up. Care was taken to keep fires down to the minimum required to destroy the broods. Supervision of control work was carried on by A.N. Weber, Forest Service, after methods were clearly understood.

Summary of Control Data

1. Concentration of Insects. A complete survey of the Echo Lakes Basin showed that insects were found largely in that portion west of Upper Echo Lake and extending to a rock rim east of Tamarack Lake. Lodgepole and white pine stands are concentrated from approximately one-half mile east of the channel on each side of Lower Echo Lake to the rim below Mount Ralston on the west. North and south these stands grow to an elevation of approximately 8,000 feet (see map). The heaviest stands are located west of Upper Echo Lake. In addition, lodgepole and white pine are found on islands in Upper Echo Lake, below the dam east of Lower Echo Lake, and on the road to Echo Summit. Trees were treated in all the above-mentioned areas.

2. Number of Trees Found. The following table is a summary showing the distribution and concentration of infested trees:

Table 1 - Distribution of Treated Trees

Locality	Area, Acres	Tree Species			
		Lodgepole Pine		White Pine	
		No. of Trees	Volume	No. of Trees	Volume
North of Echo Lakes	200	9	4,400	--	---
South of Echo Lakes	200	7	3,420	5	2,280
West of Up. Echo L.	800	54	28,690	15	17,220
Below Dam	20	1	310	3	1,590
Echo Summit	260	5	1,820	--	---
Islands, Up. Echo L.	2	--	---	1	2,280
Totals	1,482	76	38,640	24	23,370

3. Cost of Control. The total expenditures made for the completion of the Echo Lakes Project amounted to $445.35. One hundred trees were treated, at an approximate cost of $4.45 per tree. Since the average diameter of treated trees was 24 inches for lodgepole and 30 inches for white pine, this cost is well within reason.

4. Cost Distribution. The distribution of costs is shown as follows:

Salaries, 3 men - - - - - - - -	$390.35
Boat Hire and Misc.- - - - - -	20.00
Bur. of Entomology Expenses -	35.00
	$445.35

5. Effectiveness of Clean-up. A resurvey made September 15-16, 1931, by Albert Wagner and G.R. Struble, Bureau of Entomology, resulted in the location of only four newly-infested trees. One tree was found one-half mile south of the channel between the lakes, while the other three were three-fourths of a mile west of Upper Echo Lake. Only one of these, however, contained heavy broods of the mountain pine beetle. Three of the trees were infested with scattered broods of Dendroctonus monticolae Lec., Ips and Pityophthorus.

Discussion

1. Mountain pine beetle. The sources of infestation for a future outbreak of the mountain pine beetle in the Echo Lakes Basin will depend largely upon what is built up within the basin proper. Although a considerable number of trees in the Lake Valley region and Lake Audrain are still being killed, the chance for infestation coming in from those sources is small. Reconnaissance surveys, however, should be continued from year to year; and whenever trees containing brood are found, they should be treated before the broods are given a chance to spread into other trees. Home-lot owners should watch for infested trees on their property and that of their neighbors. Immediate treatment of infested trees will make certain assurance against an epidemic of this insect.

2. Fir engraver beetle. Red fir has been suffering from the ravages of the fir engraver beetle in this vicinity for the past eight years. A number of trees were starting to fade again when the reconnaissance survey of the lodgepole-white pine areas was made on September 15. No broods of the engraver beetle were found in three of such trees felled and examined; but the scars and dead areas from attacks made over a period of years had left the trees in such a weakened condition that fungi and mistletoe had hastened their death. Trees such as these are not dangerous so far as the fir engraver is concerned, since damage by them has already been done and the broods have left. Infestations by the fir engraver beetle in this area, as well as in other parts of the Lake Tahoe region, have greatly diminished.

Photo #1

Upper Echo Lake Basin looking west, Ralston Peak on the left. Control of the mountain pine beetle was carried on in this area in May 1931. Infested trees were concentrated in stands growing close together, as found along drainages.

Photo by G.R.Struble

Photo #2

Ghost trees. A group of lodgepole pine killed by the mountain pine beetle about 1920. By treating the first trees to be attacked the others in this group would have been saved.

Photo by G.R.Struble

Photo #3

Infested lodgepole pine. The large tree (left center) contained a heavy brood of the mountain pine beetle. By felling and treating this tre thousands of insects were killed which if left to emerge would kill several trees as large as this one.

Photo by G.R.Struble

Photo #4

Felling and limbing First steps in contro of mountain pine beetle. Limbs are loppe off and piled near th infested trunk and se afire. Thorough scorc ing of the bark will kill the broods beneat

Photo by G.R.Struble

Photo #5

Burning. Group of infested lodgepole pine treated by completely scorching the bark.

Photo by G.R.Struble

Photo #6

Peeling. The bark of infested white pine is too thick to allow penetration of heat. By removing the bark the brood is destroyed by sun and predacious enemies. Peeling is also essential where there is danger from fire.

Photo by G.R.Struble

FOREST INSECT CONTROL
ECHO LAKE PROJECT
LOCATION OF TREES TREATED
MAY & JUNE 1931

■ Trees infested by mountain pine beetle (number designates tree treated)

Mapped by C.R. Struble, Assistant Entomologist

Scale 4" = 1 Mile

R17E

R18E

T12N

T11N

TAMARACK LAKE

UPPER ECHO LAKE

LOWER ECHO LAKE

UPPER TRUCKEE RIVER

Water tank

ICUP LAKE

Becker Peak

LAKE VALLEY R.S.

THE PORTALS

Echo Summit Lodge

PHILLIPS HOTEL

AMERICAN RIVER

Audrain Lake

34 35 36 31

3 2 1 6